

Curriculum Vitae for Dr. Charles A. Brock
Research Physicist
NOAA Earth System Research Laboratory, Chemical Sciences Division
325 Broadway, R/CSD 2
Boulder, CO 80305
(303) 497-3795 Charles.A.Brock@noaa.gov

Education

1990	PhD	Atmospheric Sciences, <i>University of Washington</i> (<i>Peter Hobbs</i>)
1985	BSc	Atmospheric Science, <i>University of California-Davis</i>

Research Experience

Research Physicist, *NOAA Earth System Research Laboratory*, 2005 – Present

- PI for aerosol size distribution instrument suite– TexAQS 2006, ARCPAC 2008, CALNEX + Deep Water Horizon 2010 campaigns, local field and laboratory experiments
- Co-PI (with Dan Murphy) of ARCPAC 2010 airborne field project
- Development of size distribution and aerosol sampling instruments
- Aerosol emission, transformation, and transport in the troposphere
- Aerosol-climate interactions

Research Scientist III, *University of Colorado/CIRES-NOAA Earth System Research Laboratory*, 2000 – 2005

- PI for aerosol size distribution instrument suite– TexAQS 2000, ITCT 2002, ICARTT 2004 campaigns, local field and laboratory experiments

Associate Research Professor, *Dept. of Engineering, University of Denver*, 1999-2000

- PI for NMASS size distribution instrument on NASA WB-57F and ER-2, DLR Falcon
- Stratospheric aerosol formation, evolution, composition and optical properties
- Heterogeneous stratospheric chemistry
- Aerosol emissions and formation from aircraft

Assistant Research Professor, *Dept. of Engineering, University of Denver*, 1993-1999

- Aerosol instrument development and measurement on NASA ER-2 aircraft
- Polar aerosol formation, chemistry, and properties

Postdoctoral Research Associate, *Dept. of Engineering, University of Denver*, 1990-1993

- Aerosol instrument development and measurement on NASA ER-2 aircraft
- Polar aerosol formation, chemistry, and properties

Selected Publications (by topic)

Aerosol emission, transport and transformation

Brock, C. A., et al. (2010). Characteristics, sources, and transport of aerosols measured in spring 2008 during the Aerosol, Radiation, and Cloud Processes Affecting Arctic Climate (ARCPAC) project, *Atmos. Chem. Phys. Discuss.*, 10, 27361-27434, 2010.

Brock, C. A., et al. (2008). Sources of particulate matter in the northeastern United States in summer: 2. Evolution of chemical and microphysical properties, *J. Geophys. Res.*, 113(D08302).

de Gouw, J. A., **C. A. Brock**, et al. (2008), Sources of particulate matter in the northeastern United States in summer: 1. Direct emissions and secondary formation of organic matter in urban plumes, *J. Geophys. Res.*, 113(D08301).

Brock, C. A., et al. (2004). Particle characteristics following cloud-modified transport from Asia to North America, *J. Geophys. Res.*, 109(D23), 10.1029/2003JD004198.

Brock, C. A., et al. (2003). Particle growth in urban and industrial plumes in Texas, *J. Geophys. Res.*, 108(D3).

Brock, C. A., R. A. Washenfelder, M. Trainer, T. B. Ryerson, J. C. Wilson, J. M. Reeves, L. G. Huey, J. S. Hollay, D. D. Parrish, G. Hübler, F. C. Fehsenfeld (2002). Particle growth in the plumes of coal-fired power plants, *J. Geophys. Res.*, 107, AAC 9.1-9.14.

Fahey, D. W., E. R. Keim, K. A. Boering, **C. A. Brock**, J. C. Wilson, H. H. Jonsson et al. (1995). Emission measurements of the Concorde supersonic aircraft in the lower stratosphere. *Science*, 270, 70-74.

Brock, C. A., F. Schröder, B. Kärcher, A. Petzold, R. busen, and M. Fiebig (2000). Ultrafine particle size distributions measured in aircraft exhaust plumes, *J. Geophys. Res.*, 105, 26,555-26,567.

UT/LS aerosol

Brock, C. A., P. Hamill, J. C. Wilson, H. H. Jonsson and K. R. Chan (1995). Particle formation in the upper tropical troposphere: A source of nuclei for the stratospheric aerosol, *Science*, 270, 1650-1653.

Wilson, J.C., S.-H. Lee, J.M. Reeves, **C. A. Brock**, et al. (2008). Steady-state aerosol distributions in the extra-tropical, lower stratosphere and the processes that maintain them, *Atmos. Chem. Phys.*, 8, 6617-6626.

Sheridan, P. J., **C. A. Brock** and J. C. Wilson (1994). Aerosol particles in the upper troposphere and lower stratosphere: Elemental composition and morphology of individual particles in northern midlatitudes, *Geophys. Res. Letts.*, 21, 2587-2590, 10.1029/94GL01387.

Jonsson, H. H., J. C. Wilson, **C. A. Brock**, J. E. Dye, G. V. Ferry and K. R. Chan (1996). Evolution of the stratospheric aerosol in the northern hemisphere following the June 1991 volcanic eruption of Mount Pinatubo: Role of tropospheric-stratospheric exchange and transport. *J. Geophys. Res.*, 101, 1553-1570.

Biomass burning

Warneke, C., K. D. Froyd, J. Brioude, R. Bahreini, **C. A. Brock**, et al. (2010). An important contribution to springtime Arctic aerosol from biomass burning in Russia, *Geophys. Res. Letts.*, 37, L01801, 10.1029/2009GL041816.

Warneke, C., R. Bahreini, J. Brioude, **C. A. Brock**, et al. (2009). Biomass burning in Siberia and Kazakhstan as an important source for haze over the Alaskan Arctic in April 2008, *Geophys. Res. Letts.*, 36, L02813-L02813, 10.1029/2008GL036194.

Instrument development and sampling

Gallar, C., **C. A. Brock**, J. Jimenez and C. Simons (2006). A variable supersaturation condensation particle sizer, *Aerosol Sci. Technol.*, 40, 431-436, 10.1080/02786820600643339.

Bahreini, R., E. J. Dunlea, B. M. Matthew, C. Simons, K.S. Docherty, P.F. DeCarlo, J.L. Jimenez, **C. A. Brock** and A. M. Middlebrook (2008). Design and operation of a pressure controlled inlet for airborne sampling with an aerodynamic aerosol lens, *Aerosol Sci. Technol.*, 42, 465-471.

Wilson, J., B. Lafleur, H Hilbert, W. Seebaugh, J Fox, D. Gesler, **C. A. Brock**, B. Huebert and J. Mullen (2004). Function and performance of a low turbulence inlet for sampling supermicron particles from aircraft platforms, *Aerosol Sci. and Technol.*, 38, 790-802, 10.1080/027868290500841.

Pettersson, A., E. R. Lovejoy, **C. A. Brock**, S. S. Brown and A R Ravishankara (2004). Measurement of aerosol optical extinction at 532nm with pulsed cavity ring down spectroscopy, *J. Aerosol Sci.*, 35, 995-1011, 10.1016/j.jaerosci.2004.02.008.

Optical properties

Brock, C. A., et al., (1993). Relationships between optical extinction, backscatter and aerosol surface and volume in the stratosphere following the eruption of Mt. Pinatubo. *Geophys. Res. Letts.*, 20, 2555-2558.

Reeves, J. M., J. C. Wilson, **C. A. Brock** and T. P. Bui (2008). Comparison of aerosol extinction coefficients, surface area density, and volume density from SAGE II and in situ aircraft measurements, *J. Geophys. Res.*, 113(D10202).

Heterogeneous chemistry

Brown, S. S., T. B. Ryerson, A. Wollny, **C. A. Brock**, et al. (2006). Variability in nocturnal nitrogen oxide processing and its role in regional air quality, *Science*, 311(5757), 67-70.